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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/088,262	03/18/2002	Wataru Matsumoto	2611-0178P	5125

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EXAMINER	
DSOUZA, JOSEPH FRANCIS A	

ART UNIT	PAPER NUMBER
2637	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/088,262	MATSUMOTO, WATARU	
	Examiner	Art Unit	
	Adolf DSouza	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 March 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/18/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Drawings

2. Figures 31-38 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The

abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because it is not clear. The abstract is a very long single sentence, which does not allow the idea behind the invention to be conveyed in a clear manner. Also, the meaning of the phrases "units of tones", "secure a transmission rate to, for example, an extent that communication can be held.." and "securing tones" is not obvious.

Correction is required. See MPEP § 608.01(b).

5. The disclosure is objected to because of the following informalities: On page 43, line 15, "Fig. 6" should be "Fig. 7".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-3 and 5-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1-3 and 5-12, the phrase "little delay" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "little delay"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Regarding claims 1,5 and 11, the phrase "...allowing a buffer on the said first path to secure a transmission rate to an extent that communication can be held and then outputting data on the communication without being encoded" is not clear.

Regarding claims 3,10 and 13, the phrase "not encoded in Fourier –transformed frequency data ..." is not clear. It appears, from the specification, that all the data is Fourier transformed.

Regarding claims 3, 9 and 13, the phrase " other than bits of respective tones to a buffer ..." is not clear. From the specification it appears that the lower two bits are the lower two bits of the symbol that are turbo-coded. What relationship that has with the allocation of bits to the buffers on the two paths is not clear. It appears, from the

specification, that they are two separate issues but from the way it is stated in the claim, it appears they are related.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-3, 5-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gelblum et al (US 6,088,387) in view of Herzberg (US 6.034,996).

Regarding claim 1, Gelblum discloses a communication device comprising: a first path having a little delay (Fig. 1, element 9; column 3, line 51 – column 4, line 4; wherein the path having little delay is interpreted as path 9 without the interleaver); and a second path to which more delay than the delay of said first path occurs (Fig. 1, element 16, 14; column 3, line 51 – column 4, line 4; wherein the path with more delay is interpreted as the path with the interleaver 16), comprising:

a transmission section separating a processing on said first path and a processing on said second path in units of tones (Fig.1 element 26; column 4, lines 13-35), and a receiving section allocating Fourier-transformed frequency data to said first path and said second path in units of tones (Fig. 3, element 30; column 4, lines 36-41), allowing a

buffer on said first path to secure a transmission rate to an extent that communication can be held and then outputting data on the communication without being encoded (Fig. 1, element 9; column 3, line 51 – column 4, line 4; wherein the data not encoded is interpreted as the information bits on path 9), and allowing a buffer on said second path to secure remaining tones and then turbo-encoding and outputting bits on the tones (Fig 1, element 10,12,14; column 3, line 51 – column 4, line 4; wherein the turbo-encoder is interpreted as the combination of elements 12, 10 and 14) and turbo-decoding on the second path (Fig. 3, element 46, 28; column 5, lines 2-5; wherein the turbo-decoding on the second path is interpreted as being performed on one of the outputs pf the deinterleaver).

Gelblum does not disclose making hard decisions in the receiver on the first path.

In the same field of endeavor, however, Herzberg discloses hard-determining bits on the tones allocated to said first path (Fig. 6, element 72; column 8, lines 11-33; wherein the hard-determining is interpreted as being done by the subset slicer 72).

Therefore it would be obvious to one of ordinary skill in the art, at the time the invention was made, to use the method, as taught by Herzberg, in the system of Gelblum because this would allow the complexity of the system to be reduced by having the turbo-decoder operating on only a few bits.

Regarding claim 2, Gelblum does not disclose allocating bits on the first and second paths.

In the same field of endeavor, however, Herzberg discloses predetermining the number of bits allocated to a buffer on said first path and a buffer on said second path (Fig. 2, elements 43, 47; column 6, line 60 – column 7, line 19; wherein determining the number of bits is interpreted as allocation L-M bits to one path and K to the other).

Therefore it would be obvious to one of ordinary skill in the art, at the time the invention was made, to use the method, as taught by Herzberg, in the system of Gelblum because this would allow the complexity of the system to be reduced by having the turbo-decoder operating on only a few bits.

All other limitations of claim 2 are as analyzed in claim 1.

Regarding claim 3, Gelblum discloses a bitmap obtained based on an S/N ratio (column 6, line 35 – column 7, line 54).

All other limitations of claim 3 are as analyzed in claim 1.

Claims 5 and 6 are similarly analyzed as claim 1.

Claims 7 and 8 are similarly analyzed as claim 2.

Claims 9 and 10 are similarly analyzed as claim 3.

As to claims 11-13, the steps claimed as method are nothing more than restating the function of the specific components of the apparatus as claimed above and therefore, it would have been obvious, considering the aforementioned rejection for the apparatus claims 1-3 respectively.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yi (US 5,978,365) in view of Berrou (Near Optimum Error Correcting Coding and Decoding: Turbo Codes, October 1996, IEEE Transactions on Communications).

Regarding claim 4, Yi discloses a first recursive organization convolutional encoder convolutional-encoding an information bit sequence of one system and outputting first redundant data (Fig. 6, element 602A; column 13, lines 57-63); a second recursive organization convolutional encoder convolutional-encoding the information bit sequence after being interleaved and outputting second redundant data (Fig. 6, elements 602B, 601; column 13, lines 57-63); and a puncturing circuit thinning out each redundant data at predetermined timing and outputting one of the redundant bits (Fig. 6, elements 603A, 603B; column 14, lines 34-42), wherein if the recursive organization convolutional encoder having a constraint length of "5" and the number of memories is "4" or the

constraint length of "4" and the number of memories is "3" is assumed (Fig. 6, element 602A, 602B; column 14, lines 34-42; wherein the number of memories is 4 as shown in Fig. 6),

Yi does not disclose all patterns are searched and that the encoder satisfies optimal conditions.

In the same field of endeavor, however, Berrou discloses all connection patterns constituting the encoder are searched (page 1263, section B, 1st paragraph; wherein all connection patterns searched is interpreted as generation of all paths as a distance d from the null path);
and the encoder satisfying optimal conditions that a distance between two bits "1" of a self-terminating pattern with a specific block length becomes a maximum and that a total weight becomes a maximum in the pattern having the maximum distance, is provided as each of said first and second recursive organization convolutional encoders (page 1264, section B).

Therefore it would be obvious to one of ordinary skill in the art, at the time the invention was made, to use the method, as taught by Berrou, in the system of Yi because this would ensure that the optimum path is chosen, thereby reducing the error rate of the system.

Other Prior Art Cited

The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure.

The following patents cited to further show the state of the art with respect to multichannel systems and turbo codes in general:

Chouly et al. (US 6,038,696) discloses a communication system utilizing turbo codes.

Chouly et al. (US 5,944,850) discloses a communication system utilizing turbo codes.

Raleigh et al. (US 6,144,711) discloses a multichannel communication system.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adolf DSouza whose telephone number is 571-272-1043. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AD

Adolf DSouza
Examiner
Art Unit 2637

JAY K. PATEL
SUPERVISORY PATENT EXAMINER